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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,673	01/02/2001	Soeren Moritz	Q59736	8001

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EXAMINER	
FERRIS III, FRED O	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/750,673	MORITZ ET AL.	
	Examiner	Art Unit	
	Fred Ferris	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2005* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 11-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 April 2005 has been entered. Applicants have now cancelled claim 10. Claims 1-9, and 11-26 are currently pending in this application. Claims 1-9, and 11-26 remain rejected based on new grounds for rejection.

Response to Arguments

2. Applicants arguments filed on 19 April and 18 May of 2005 have been fully considered.

Regarding applicants response to 112(1) rejections: The examiner withdraws the 112(1) rejection in view of applicants arguments filed 19 April and 18 May of 2005. In summary, the rejection is withdrawn in view of applicants arguments that the claimed features relating to "comparing the information data of the installation components with picture data", "identifying components in the picture data", and " deriving hypotheses regarding the identified components", are realized using conventional techniques which are well known in the art of image recognition and processing (page 15, paragraph 1, page 16, paragraphs 1 & 3).

Regarding applicant's response to 103(a) rejection: Applicant's arguments with respect to the previous 103(a) rejection of claims 1-9, and 11-26 have been considered but are moot in view of the new ground(s) of rejection. (Please see new art rejection below)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. ***Claims 1-9, and 11-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Three Dimensional Object Recognition", Besl et al, Computing Surveys, Vol. 17, No. 1, March 1985 in view of U.S. Patent 5,740,341issued to Oota et al or "Reconstruction of 3D Virtual Buildings fro 2D Architectural Floor Plans", So et al, VRST 98', ACM 1-58113-019/98/0011, ACM 1998.***

Independent claim 1 is drawn to:

Generating an **image of installation model** by:
Memory (1st) for storing **picture data**
Memory (2nd) for storing **component information**
Memory (3rd) for storing **virtual installation model**
Evaluation and control unit for comparing component information data with real picture data
Identifying components in **picture data** as **installation components**
Deriving a hypotheses for **identified components** in **picture data**
Generating respective **installation components** in **virtual installation model**

Regarding independent claim 1: Besl discloses computer based methods and systems for the identification of 3D objects (components) from 2D image (picture) data (Sections 2.0-4.0) inclusive of comparing object information data with image (picture) data and identifying the objects. (Sections 5.2-5.6, page 124, col. 2, line 9, Figs. 39, 40) That is, Besl renders obvious the claimed features of the evaluation and control unit by setting forth a functionally equivalent process. (See Figs. 29, 39, 40, especially Fig. 29) In particular, Besl discloses object recognition programs such as IMAGINE (page 119, paragraph 3-4), which identify objects by evaluating primitives (geometric) representing a physical object (component) where the image is specified as a set of parameters that correspond to locations in the image model. (Sections 5.3-5.6, also see ACRONYM, Section 5.8) The recognition process includes the use of an object model library (page 122-124) and the process of deriving a hypothesis for identified objects (page 119, column 2, page 130, column 2) in the image. Obviously, the system disclosed in Fig. 29, page 110 of Besl includes a memory for storing the digitized picture and object information, otherwise the device would not operate.

Besl does not explicitly teach displaying a virtual representation of the facilities installation of components.

Oota and So both teach systems capable of displaying and modeling a virtual representation of installed components (i.e. a virtual model) in a facility or building. Specifically, Oota teaches system for displaying a model of a virtual building including components (piping, etc.) that have been interactively arranged to form a virtual model. (Abstract, CL2-L3-41, CL16-L6-11, Figs. 3, 10-12) So teaches the use of commercially available virtual reality modeling software (3D Studio Max, Kinetex 3D, Softimage 3D, AutoCAD, etc.) in creating a virtual installation model of a building that includes installation components. (Abstract, Sections 1, 2.0, 2.2, 3.2, Figs. 1, 4, 5, 8, 10-16)

It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Besl relating to the identification of 3D objects (components) from 2D image (picture) data, with the teachings of Oota or So relating to the virtual modeling of components in a building, to realize the elements of the claimed invention. An obvious motivation exists since, turning to the prior art, we find successful use of picture (image) data in the virtual modeling of buildings. (See: Marks, CL3-L2-9, Fig. 2) Further, the level of skill required by an artisan to realize the claimed limitations of the present invention is clearly established by all references. (See: Besl/Oota or So, Background/Abstract) Accordingly, a skilled artisan tasked with developing a system requiring object (component) recognition from image data (pictures) and virtual modeling of building component, and having access to the teachings of Besl and Oota or So, would have known to turn to the prior art, and knowingly modified the teachings of Besl, with the teachings of Oota or So (or visa

versa), to realize the claimed elements of the present invention while gaining the advantages of reduced cost and development time.

Regarding dependent claims 2-4: Besl teaches performing image analysis on picture data and an object library as previously cited above. Oota and So both teach using virtual components (installation components) from a library of components representing the total virtual system (Oota: CL5-L15-59, Fig. 2 (component/part database, So: Section 2.0). Oota and So further teach objects being located by geometric information and multiple window views of picture data and 3D (virtual) model views (Oota: Figs. 11(1-3), 15, 17, So: Figs. 3, 4, 10-12, 14-16) and would have knowingly been incorporated by a skilled artisan using the reasoning previously cited above.

Regarding dependent claims 5-9: Oota and So disclose building a 3D (virtual) model using the well-known techniques of "dropping", "clicking and dragging", and "rubber banding" in the manipulation of primitives based on geometric information (Oota: CL2-L38, So: Section 2.0, Fig. 1). These features are also obvious OS features (such as Windows), and would have knowingly been incorporated by a skilled artisan. (See: Microsoft Computer Dictionary, 3rd Edition 1997, terms: drop, drag, rubber banding) Oota and So also teach the evaluation of structural components (by function) to assign primitives (add components) in a 3D (virtual) installation model. (Oota: CL5-L15-59, Fig. 2, So: 3.2, 3.4, Fig. 1)

Regarding dependent claims 11-12: Besl teaches that the image data can be from any digital image source as noted above (see Fig. 29). Oota and So teach virtual

models from CAD system with memory and a multiple perspective view display as noted above (Oota: Figs. 11(1-3), 15, 17, So: Figs. 3, 4, 10-12, 14-16)

Independent claim 13 is drawn to:

Generating an **image of real installation model** by:
Generating **picture data**
comparing component information data with picture data
Identifying components in **picture data** as **installation components**

Regarding independent claims 13 and 25: As previously cited, Besl discloses computer based methods and systems for the identification of 3D objects (components) from 2D image (picture) data (Sections 2.0-4.0) inclusive of comparing object information data with image (picture) data and identifying the objects. (Sections 5.2-5.6, page 124, col. 2, line 9, Figs. 39, 40) That is, Besl renders obvious the claimed features of the evaluation and control unit by setting forth a functionally equivalent process. (See Figs. 29, 39, 40, especially Fig. 29) In particular, Besl discloses object recognition programs such as IMAGINE (page 119, paragraph 3-4), which identify objects by evaluating primitives (geometric) representing a physical object (component) where the image is specified as a set of parameters that correspond to locations in the image model. (Sections 5.3-5.6, also see ACRONYM, Section 5.8) The recognition process includes the use of an object model library (page 122-124) and the process of deriving a hypothesis for identified objects (page 119, column 2, page 130, column 2) in the image. Obviously, the system disclosed in Fig. 29, page 110 of Besl includes a

memory for storing the digitized picture and object information, otherwise the device would not operate.

Besl does not explicitly teach displaying a virtual representation of the facilities installation of components.

Oota and So both teach systems capable of displaying and modeling a virtual representation of installed components (i.e. a virtual model) in a facility or building. Specifically, Oota teaches system for displaying a model of a virtual building including components (piping, etc.) that have been interactively arranged to form a virtual model. (Abstract, CL2-L3-41, CL16-L6-11, Figs. 3, 10-12) So teaches the use of commercially available virtual reality modeling software (3D Studio Max, Kinetex 3D, Softimage 3D, AutoCAD, etc.) in creating a virtual installation model of a building that includes installation components. (Abstract, Sections 1, 2.0, 2.2, 3.2, Figs. 1, 4, 5, 8, 10-16)

It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Besl relating to the identification of 3D objects (components) from 2D image (picture) data, with the teachings of Oota or So relating to the virtual modeling of components in a building, to realize the elements of the claimed invention. An obvious motivation exists since, turning to the prior art, we find successful use of picture (image) data in the virtual modeling of buildings. (See: Marks, CL3-L2-9, Fig. 2) Further, the level of skill required by an artisan to realize the claimed limitations of the present invention is clearly established by all references. (See: Besl/Oota or So, Background/Abstract) Accordingly, a skilled artisan tasked with developing a system requiring object (component) recognition from image data

(pictures) and virtual modeling of building components, and having access to the teachings of Besl and Oota or So, would have known to turn to the prior art, and knowingly modified the teachings of Besl, with the teachings of Oota or So (or visa versa), to realize the claimed elements of the present invention while gaining the advantages of reduced cost and development time.

Regarding dependent claims 14-16: Besl teaches performing image analysis on picture data and an object library as previously cited above. Oota and So both teach using virtual components (installation components) from a library of components representing the total virtual system (Oota: CL5-L15-59, Fig. 2 (component/part database, So: Section 2.0). Oota and So further teach objects being located by geometric information and multiple window views of picture data and 3D (virtual) model views (Oota: Figs. 11(1-3), 15, 17, So: Figs. 3, 4, 10-12, 14-16) and would have knowingly been incorporated by a skilled artisan using the reasoning previously cited above.

Regarding dependent claims 17-24: Oota and So disclose building a 3D (virtual) model using the well-known techniques of "dropping", "clicking and dragging", and "rubber banding" in the manipulation of primitives based on geometric information (Oota: CL2-L38, So: Section 2.0, Fig. 1). These features are also obvious OS features (such as Windows), and would have knowingly been incorporated by a skilled artisan. (See: Microsoft Computer Dictionary, 3rd Edition 1997, terms: drop, drag, rubber banding) Oota and So also teach the evaluation of structural components (by function) to assign primitives (add components) in a 3D (virtual) installation model. (Oota: CL5-

L15-59, Fig. 2, So: 3.2, 3.4, Fig. 1) Both Oota and So teach an automatic process (Oota: Abstract, So: Sections 2-3)

Per dependent claim 26: Besl teaches that the image data can be from any digital image source as noted above (see Fig. 29). Oota and So teach virtual models from CAD system with memory and a multiple perspective view display as noted above (Oota: Figs. 11(1-3), 15, 17, So: Figs. 3, 4, 10-12, 14-16)

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 5,887,041 issued Zachar et al teaches component recognition from picture data.

U.S. Patent 6,404,913 issued to Ohki teaches synthesized graphics from photographs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the

examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached at 571-272-3780. The Official Fax Number is: (703) 872-9306

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